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Air Quality
CLARK COUNTY • DEPARTMENT OF AIR QUALITY
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PART 70
TECHNICAL SUPPORT DOCUMENT
(STATEMENT of BASIS)

APPLICATION FOR:
Operating Permit Minor Revision

SUBMITTED BY
Trinity Consultants

Silverhawk Generating Station
Source ID: 01584

LOCATION:
15111 Apex Power Parkway
Las Vegas, Nevada 89124

SIC code 4911, "Electric Services"
NAICS code 221112, "Fossil Fuel Electric Power Generation"

January 2, 2020

EXECUTIVE SUMMARY

NV Energy's Silverhawk Generating Station (SGS) is an electrical power generating station located at 15111 Apex Power Parkway in North Las Vegas, Nevada. The legal description of the source location is as follows: portions of Township 18S, Range 63E, Section 5 in Apex Valley, County of Clark, State of Nevada. The source is situated in hydrographic area 216 (Garnett Valley). Garnett Valley is currently designated attainment for all regulated pollutants.

SGS is a major stationary source for PM_{10}, $PM_{2.5}$, NO_x, and CO and a minor source for SO_2, VOC, and HAPs pollutants. The generating station operates two 175 MW natural gas-fired combustion turbine generators, two heat recovery steam generators with natural gas-fired duct burners, one steam turbine generator, one 3-cell, 6,600 gpm cooling tower, one 100 hp LPG-fired emergency generator, one 250 hp diesel-powered fire pump, and a 2,206 hp diesel emergency generator. The potential electrical generating capacity of the source is above 250 MMBtu/hr. As a result, the source is a categorical source, as defined by AQR 12.2.2(j)(1). SGS is also a source of GHG pollutants.

The following table summarizes SGS's potential-to-emit for each regulated air pollutant for all emission units identified by this Part 70 OP. These emission rates are for reference purposes only and are not intended to be enforced by direct measurement unless otherwise noted in Section III below.

Pollutant	PM_{10}	$PM_{2.5}$	NO_X	CO	SO_2	VOC	HAPs	GHG[2]
Tons/year	149.00	149.00	318.91	562.38	10.35	85.57	5.39	1,955.804.82
Major Source Thresholds (Title V)	100	100	100	100	100	100	10/25[1]	-
Major Stationary Source Thresholds (PSD)	250	250	250	250	250	250	10/25[1]	-
Major Stationary Source Threshold (Nonattainment)			100			100		

[1]Ten tons for any individual hazardous air pollutant, or 25 tons for the combination of all hazardous air pollutants.
[2]Metric tons per year, CO2e.

DAQ will continue to require sources to estimate their GHG potential to emit in terms of each individual pollutant (CO_2, CH_4, N_2O, CF_6, etc.) and the TSD includes these PTEs for informational purposes.

The turbines are subject to the requirements of 40 CFR Part 60, Subparts A and GG, the heat recovery steam generators to the turbines are subject to 40 CFR Part 60, Subparts A and Da, the fire pump and emergency generator are subject to 40 CFR Part 63, Subpart ZZZZ, the 2019 diesel emergency generator is subject to 40 CFR Part 60, Subpart IIIII, and the facility is subject to 40 CFR Part 72 and 75.

DAQ has received delegated authority from the U.S. Environmental Protection Agency to implement the requirements of the Part 70 OP. Based on the information submitted by the applicant and a technical review performed by DAQ staff, the draft revised Part 70 OP to NV Energy is proposed.

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LIST OF TABLES

I. ACRONYMS

Table I-1: List of Acronyms

Acronym	Term
AQR	Clark County Air Quality Regulations
ATC	Authority to Construct
CAAA	Clean Air Act, as amended, or Clean Air Act Amendments
CEMS	Continuous Emissions Monitoring System
CF_6	Carbon Floride
CFC	Chlorofluorocarbon
CFR	United States Code of Federal Regulations
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
DAQ	Clark County Department of Air Quality
dscf	Dry Standard Cubic Feet
DOM	Date of Manufacturer
EPA	United States Environmental Protection Agency
EU	Emission Unit
GHG	Greenhouse Gases
HAP	Hazardous Air Pollutant
HCFC	Hydrochlorofluorocarbon
HHV	High Heating Value
hp	Horse Power
HRSG	Heat Recovery Steam Generator
MMBtu	Millions of British Thermal Units
MW	Megawatt
N_2O	Nitrous Oxide
NAICS	North American Industry Classification System
NESHAP	National Emission Standard for Hazardous Air Pollutants
NO_X	Nitrogen Oxides
NSPS	New Source Performance Standards
O_2	Oxygen
OP	Operating Permit
$PM_{2.5}$	Particulate Matter less than 2.5 microns
PM_{10}	Particulate Matter less than 10 microns
ppmvd	Parts per Million, Volumetric Dry
PSD	Prevention of Significant Deterioration
PTE	Potential to Emit
QA/QC	Quality Assurance/Quality Control
QAP	Quality Assurance Plan
RATA	Relative Accuracy Test Audit
RMP	Risk Management Plan
scf	Standard Cubic Feet
SCR	Selective Catalytic Reduction
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SO_X	Sulfur Oxides
TDS	Total Dissolved Solid
TSD	Technical Support Document
U.S.C.	United States Code
VOC	Volatile Organic Compound

II. SOURCE INFORMATION

A. GENERAL

Permittee:	Nevada Power Company
Mailing Address:	6226 West Sahara Avenue
Responsible Official:	Dariusz Rekowski
Phone Number:	702-402-5762
Hydrographic Area:	216, the Garnett Valley

B. DESCRIPTION OF PROCESS

Silverhawk Generating Station operates two 175 MW natural gas-fired combustion turbine generators, two heat recovery steam generators with natural gas-fired duct burners, one steam turbine generator, one 3-cell, 6,600 gpm cooling tower, one 100 hp LPG-fired emergency generator, one 250 hp diesel-powered fire pump, and a 2,206 hp diesel emergency generator.

Table II-B-1 lists the emission units covered by this operating permit.

Table II-B-1: Summary of Emission Units

EU	Description	Rating	Manufacturer	Model #	Serial #	SCC
A01	Natural Gas-Fired Turbine	175 MW	Westinghouse	501FD	37A-8193-1	20100201
A02	Duct-Burner Heat Recovery Steam Generator (associated with A01)	530 MMBtu/hr	Alstom			10100601
A03	Natural Gas-Fired Turbine	175 MW	Westinghouse	501FD	37A-8194-1	20100201
A04	Duct-Burner Heat Recovery Steam Generator (associated with A03)	530 MMBtu/hr	Alstom			10100601
A05	Diesel-Powered Fire Pump; DOM: 2004	250 hp	Clarke	JU6HUF50	PE6068TF234110	20200102
A06	LPG-Powered Emergency Engine; DOM: 2004	100 hp	Generac	SG060	2072892	20201001
A07	Three-Cell Cooling Tower; 0.001% Drift Loss; 8,144 ppm TDS	6,600 gpm	International Cooling Tower	FCC-12-03	FCC-12-03-8434-03	38500101
A08[1]	Emergency Generator	1,500 kW	Caterpillar	3512C	TBD	20200102
	Diesel-Powered Engine; DOM: 2019	2,206 hp		TBD	TBD	

[1]New

The following units or activities listed in in Table II-B-2 are present at this source, but are being deemed insignificant.

Table II-B-2: Insignificant Activities

Description
Mobile Combustions Sources
Station Maintenance Activities
Maintenance Shop Activities (e.g., part washers, sand blasters, etc.)
Steam Cleaning Operations
LPG Tank, 500 gallons
Diesel Tank, 280 gallons
Lube oil sumps and vents
Portable gas-fired pump, 3.5 hp

C. PERMITTING HISTORY

The following represents permitting activities prior to this permitting action:

Table II-C-1: Permit History

Issue Date	Description
07/20/2016	Part 70 permit issued

D. CURRENT PERMITTING ACTION

This is a minor revision to the Part 70 permit. The source is requesting the following:

1. Add a new 2,206 hp emergency generator (EU: A08).

E. ALTERNATE OPERATING SCENARIO

None proposed.

III. EMISSIONS INFORMATION

A. SOURCE-WIDE PTE

Silverhawk Generating Station is a Title V major source for PM_{10}, $PM_{2.5}$, NO_x, and CO and a minor source for SO_2, VOC, and HAPs pollutants, including greenhouse gases (GHGs).

Table III-A-1: Source-wide PTE (tons per year)

PM_{10}	$PM_{2.5}$	NO_X	CO	SO_2	VOCs	HAPs	GHGs[1]
149.00	149.00	318.91	562.38	10.35	85.57	5.39	1,955,775.63

[1]Metric tons per year.

B. ALLOWABLE EMISSIONS CALCULATIONS

The following tables summarize the Allowable PTE.

Table III-B-1: PTE— Emission Units

EU	PM_{10}	$PM_{2.5}$	NO_x	CO	SO_2	VOC	HAPs
A01 + A02	73.80	73.80	154.10	280.40	5.10	42.60	2.67
A03 + A04	73.80	73.80	154.10	280.40	5.10	42.60	2.67
A05	0.14	0.14	1.94	0.42	0.13	0.16	0.02
A06	0.01	0.01	0.77	0.10	0.01	0.02	0.01
A07	1.20	1.20	0.00	0.00	0.00	0.00	0.00
A08	0.05	0.05	8.00	1.06	0.01	0.19	0.02
Total	149.00	149.00	318.91	562.38	10.35	85.57	5.39

C. OPERATIONAL LIMITS

All previous operational limits remain in effect.

D. CONTROL TECHNOLOGY

The proposed new emergency generator meets the NSPS subpart IIII standards.

All previous emissions controls remain in effect.

E. MONITORING

All monitoring requirements remain in effect.

F. PERFORMANCE TESTING

None required due to this permitting this action; therefore all previous testing requirements remain in effect.

G. RACT ANALYSIS

Table III-G-1: Emissions Increase

	PM_{10}	$PM_{2.5}$	NO_x	CO	SO_2	VOC	H_2S	Pb
Minor NSR Significance Thresholds	7.5	5.0	20	50	20	20	5	0.6
Existing Permit	145.95	145.95	310.91	561.32	10.34	85.38	0	0
New Permit	149.00	149.00	318.91	562.38	10.35	85.57	0	0
Total Δ PTE	0.05	0.05	8.00	1.06	0.01	0.19	0	0
Triggers	None	None	None	None	None	None	None	None

IV. REGULATORY REVIEW

A. LOCAL REGULATORY REQUIREMENTS

DAQ has determined that the following public laws, statutes, and associated regulations are applicable:

- AQR 26, "Emission of Visible Air Contaminants"
- AQR 40, "Prohibitions of Nuisance"
- AQR 43, "Odors in the Ambient Air"
- AQR 70, "Emergency Procedures"
- AQR 80, "Circumvention"

B. FEDERALLY APPLICABLE REGULATIONS

Subpart IIII—Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

40 CFR Part 60.4200 Am I subject to this subpart?

Discussion: Silverhawk Generating Station has a 2,206-hp 2019 emergency diesel engine (EU: A08) is subject to 40 CFR Part 60, Subpart IIII.

This source has provided certifications for the emergency diesel engine listed above that demonstrate compliance with Subpart IIII.

This emergency diesel engine has demonstrated compliance with the emission standards set forth in 40 CFR Part 89.112 for new nonroad internal combustion (IC) engines for the same model year and maximum engine power, which are provided in Table IV-B-1.

Table IV-B-1: Emission Standards for IC Engines

EU	Year	Power (kW)	NO_x (g/kW-hr)	NMHC (g/kW-hr)	CO (g/kW-hr)	PM (g/kW-hr)
A08	2019	> 560	3.5	0.19	3.5	0.04

The 2,206 hp emergency diesel engine at this source is subject to 40 CFR Part 60, Subpart IIII and the fire pump is subject to 40 CFR Part 63, Subpart ZZZZ, also must meet the fuel requirements it references from 40 CFR Part 80.510(b) (in Subpart I) for nonroad diesel fuel. The source must purchase diesel fuel that meets the per-gallon standard of 15 parts per million (ppm) maximum sulfur content, a minimum cetane index of 40, or a maximum aromatic content of 35 volume percent. Since all refiners and importers of nonroad diesel fuel are subject to these federal standards, pursuant to 40 CFR Part 80.510, it is reasonable to assume the operators of the engines have little, if any, opportunity to acquire fuel that violates these standards. Therefore, the OP does not require the permittee to monitor or keep records of the sulfur content, cetane index, or aromatic content of the diesel fuel used in the emergency diesel engine and fire pump.

V. COMPLIANCE

A. COMPLIANCE CERTIFICATION

Records shall be kept for all limitations specified in the permit.

Requirements for reporting remain the same.

B. SUMMARY OF MONITORING FOR COMPLIANCE

Table V-C-1: Compliance Monitoring

EU	Process Description	Monitored Pollutants	Applicable Subsection Title	Requirements	Compliance Monitoring
A08				Sulfur limited to 15 ppm and either a minimum cetane index of 40 or a maximum aromatic content of 35% by volume.	Recordkeeping of fuel use and hours of operation with a nonresettable hour meter. Nevada State law

VI. EMISSION REDUCTION CREDITS (OFFSETS)

None.

VII. MODELING

A. INCREMENT ANALYSIS

Silverhawk Generating Station is a major source in Hydrographic Area 216 (Garnet Valley). Permitted emission units include two turbines, one fire pump, two generators and one cooling tower. Since minor source baseline dates for PM_{10} (December 31, 1980), NO_2 (January 24, 1991) and SO_2 (December 31, 1980) have been triggered, Prevention of Significant Deterioration (PSD) increment analysis is required.

DAQ modeled the source using AERMOD to track the increment consumption. Stack data submitted by the applicant were supplemented with information available for similar emission units. Five years (2011 to 2015) of meteorological data from the McCarran Station were used in the model. U.S. Geological Survey National Elevation Dataset terrain data were used to calculate elevations. Table VII-A.1 shows the location of the maximum impact and the potential PSD increment consumed by the source at that location. The impacts are below the PSD increment limits.

Table VII-A.1: PSD Increment Consumption

Pollutant	Averaging Period	Source's PSD Increment Consumption (µg/m³)	Location of Maximum Impact	
			UTM X (m)	UTM Y (m)
SO_2	3-hour	19.08[1]	683061	4031511
SO_2	24-hour	6.53[1]	683069	4031559
SO_2	Annual	2.50	683069	4031559
NO_X	Annual	4.52	682950	4031747
PM_{10}	24-hour	10.80[1]	683069	4031559
PM_{10}	Annual	3.48	683069	4031559

[1] Second High Concentration.

VIII. ATTACHMENTS

Table VIII-1: Engine Calculations

EU#	A08		**Horsepower:**	2,206		**Emission Factor (lb/hp-hr)**	**Control Efficiency**	**Potential Emissions**		
Make:			**Hours/Day:**	24.0				**lb/hr**	**lb/day**	**ton/yr**
Model:			**Hours/Year**	500	**PM10**	8.82E-05	0.00%	0.19	4.67	0.05
S/N:					**NOx**	1.45E-02	0.00%	32.00	768.03	8.00
					CO	1.92E-03	0.00%	4.23	101.55	1.06
Manufacturer Guarantees					**SO_2**	1.21E-05	0.00%	0.03	0.64	0.01
PM10	0.04	g/hp-hr			**VOC**	3.53E-04	0.00%	0.78	18.68	0.19
NOx	6.58	g/hp-hr			**HAP**	3.05E-05	0.00%	0.07	1.62	0.02
CO	0.87	g/hp-hr								
SO_2		lb/hp-hr								
VOC	0.16	g/hp-hr								
Engine Type:	Diesel				Diesel Fuel Sulfur Content is 15 ppm (0.0015%)					

Table VIII-2: Greenhouse Gases Calculations

EU: A08	Engine	2,206 hp	500	0.138	55150	CO_2	73.96	104.6	14.43	1067.60	533798.90	533.80	1	533.80
						CH_4	0.003	104.6	14.43	0.04	21.65	0.02	25	0.54
						N_2O	0.0006	104.6	14.43	0.01	4.33	0.004	298	1.29

CO_2	533.80	tons/yr
CH_4	0.54	tons/yr
N_2O	1.29	tons/yr
GHG	533.80	tons/yr
CO_2e	535.63	tons/yr

Fuel usage calculation: (.035 lb/hp-hr x hp x hrs/yr)/7 lb/gal

GWP is used to compare the abilities of different greenhouse gases to trap heat in the atmosphere. GWP is based on the heat-absorbing ablity of each gas relative of that of CO_2. Once the individual GHG emissions are calculated, thet have to be multipled by the GWP to obtain the CO_2e value.

Table VIII-3 summarizes PTE with its allowable operational condition for each emission unit in the OP. This table can be used to prepare Annual Emissions Inventory Reports with forms available on DAQ's website (http://www.clarkcountynv.gov). The values below should be entered as the PTE for each respective emission unit when using the annual emission inventory reporting forms provided by DAQ.

Table VIII-3: Source-Wide Emission Unit PTE Summary (tons per year)

EU	Condition	PM_{10}	$PM_{2.5}$	NO_x	CO	SO_2	VOC	HAPs	Pb
A01 + A02	8,900 hrs/yr	73.80	73.80	154.10	280.40	5.10	42.60	2.67	0
A03 + A04	8,900 hrs/yr	73.80	73.80	154.10	280.40	5.10	42.60	2.67	0
A05	500 hrs/yr	0.14	0.14	1.94	0.42	0.13	0.16	0.02	0
A06	500 hrs/yr	0.01	0.01	0.77	0.10	0.01	0.02	0.01	0
A07	8,760 hrs/yr	1.20	1.20	0	0	0	0	0	0
A08	500 hrs/yr	0.05	0.05	8.00	1.06	0.01	0.19	0.02	0